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I also certify that by virtue of an assignment registered under the Patents Act 1977, the application is now proceeding in the name as substituted.

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GB9828843.4

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Concept House
Cardiff Road
Newport
Wales NP9 1RH

By virtue of a direction given under Section 30 of the Patents Act 1977, the application is proceeding in the name of

Switchboard
01633-814000

APW ELECTRONICS LIMITED
Electron Way
Chandlers Ford
EASTLEIGH
Hampshire
SO53 4ZR
United Kingdom
Incorporated in the United Kingdom

[ADP No. 07719974001].

Patents Form 1/77Patents Act
(See 16)31DEC98 E415113-5 002246
P01/7700 0.00 - 9828843.4**Request for a grant of a patent**

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The Patent Office

Cardiff Road
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1. Your reference

P005090GB

2. Patent application number
(The Patent Office will fill in this part)**9828843.4**

30 DEC 1998

3. Full name, address and postcode of the or of each applicant
(underline all surnames)

VERO ELECTRONICS LIMITED

Electron Way
Chandler's Ford
Eastleigh
Hampshire
SO53 4ZR

Patents ADP number (if you know it)

United Kingdom

4. Title of the invention

AN ELECTRICAL CABINET AND A FRAME
THEREFOR

5. Name of your agent (if you have one)

D YOUNG & CO

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

21 NEW FETTER LANE
LONDON
EC4A 1DA

Patents ADP number (if you have one)

59006

6. If you are declaring priority from one or more earlier patent applications, give the country and date of filing of the or each of these earlier applications and (if you know it) the or each application number

Country

Priority application number
(if you know it)Date of filing
(day/month/year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and filing date of the earlier application

Number of earlier application

Date of filing
(day/month/year)

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:
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Description 3 ✓ 8 ✓

Claims(s) 3 ✓

Abstract 1

Drawing(s) 4 ✓ 4

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Priority documents None

Translations of priority documents None

Statement of inventorship and right to grant of a patent (Patents Form 7/77) None

Request for preliminary examination and search (Patents Form 9/77) One ✓

Request for substantive examination (Patents Form 10/77) None

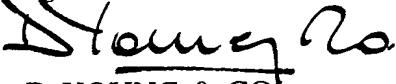
Any other documents (please specify) None

11. I/We request the grant of a patent on the basis of this application.

Signature

Date

30 12 98


D YOUNG & CO
Agents for the Applicants

12. Name and daytime telephone number of the person to contact in the United Kingdom W M C PURVIS 01703 634816

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AN ELECTRICAL CABINET AND A FRAME THEREFOR

This invention relates to frames for electrical cabinets and to electrical cabinets.

Electrical cabinets for receiving electronic and electrical components, are used in connection, for example, with the operation of local data networks. The components, for example, subracks with electronic and electrical components, fans and other accessories are mounted within the cabinets on internal frames. The cabinets generally have side panels, a door and end panels that surround and are mounted on the frame.

These electrical cabinets require access for cables, which are often thick and unwieldy, and also for people to service the appliances. Conventional frames have substantial die-cast end members. One frame of the prior art is designed with end members that have recesses in the sides, these recesses can be used for cable access so that, with the side panels of the cabinet removed, cables do not need to be threaded through access holes. Despite the advantages of side recesses these end members are nevertheless, bulky, expensive to manufacture and the space for the cables is limited.

According to one aspect of the invention there is provided a frame of an electrical cabinet, said frame comprising at least one transverse member connected to at least two side members; said transverse member having a skeletal form consisting of at least one tube and/or bar with at least one side of said transverse member having a recess in a substantial part of said at least one side.

The device of the present invention overcomes or at least alleviates the problems of the prior art by providing transverse members which are skeletal in form, making them cheap to manufacture. The skeletal form also provides for large recesses which allow good cable access and also enable service personnel to place their feet inside the cabinet giving them better access to the electronic equipment they are servicing. Thus the present invention can provide a frame for an electrical cabinet with improved performance and at approximately two thirds of the price of the frames of the prior art.

Preferably, the frame comprises two transverse members, the two transverse members being arranged at opposite ends of the frame and being connected together by the at least two side members. Advantageously, the frame also comprises four side members. The provision of four side members and transverse members at either end of the frame provides a robust construction for the frame.

In preferred embodiments, the transverse member is formed from two bars or tubes connected together. Advantageously, these two bars or tubes have the same shape and are connected at and around points half way along their respective lengths. The use of bars or tubes having substantially the same shape reduces manufacturing costs.

5 The tubes or bars may, advantageously, be substantially "U" shaped and may be connected together at the bases of the two "U"s. This provides a robust shape from a small amount of material. It also provides large recesses in the sides which are convenient for cable and personnel access.

In some embodiments, the base of the "U" shaped bars or tubes are substantially straight.
10 This arrangement allows for the two bars to be more easily and robustly joined together. This is particularly so if they are welded or brazed together. Welding and brazing provide a convenient, strong and cost effective way of joining the two components.

In an alternative embodiment, the bars or tubes are joined to form a substantially cross shape, preferably an elongate cross shape wherein the end portions of one side of said elongate
15 cross is parallel to the other side. This arrangement also provides for large side recesses.

In some embodiments, the transverse member may comprise further strengthening bars or tubes connected to both of said two tubes or bars.

According to another aspect of the invention, there is provided an electrical cabinet comprising a frame as described above and further comprising removable side panels, end panels
20 and/or doors. Electrical cabinets may require the various components to be interchanged or serviced and therefore the provision of side and end panels that are easily removable is very convenient. Although these panels and doors may be screwed on, in preferred embodiments they are attached to the frame by hooks thereby facilitating their removal.

Although the side panels may be mounted directly to the frame, in some embodiments they
25 are mounted on cantilevers extending out from the frame. This arrangement allows for extra space at the sides of the cabinet.

Embodiments of the present invention will now be described, by way of example only, and with reference to the accompanying drawings, in which:

Figure 1 illustrates a frame according to an embodiment of the present invention;

30 Figure 2 illustrates the frame of Figure 1 with associated side and end panels and a quick-release door;

Figure 3 illustrates a portion of an electrical cabinet according to another embodiment of the present invention;

Figure 4 illustrates a transverse member for a frame according to an embodiment of the present invention.

Figure 1 illustrates a frame according to an embodiment of the present invention. The frame 10 comprises tubular side members 20, connected together by two tubular transverse members 30 at either end of the side members. The tubular transverse members comprise two straight based "U" shaped tubes 32, 34 welded together. Although in preferred embodiments the transverse member is comprised of tubular members welded together it may alternatively be formed of bars, and the two pieces may be crimped or screwed together.

Figure 2, illustrates side panels 40, an end panel 50 and a removable door 60 that are mounted on the frame of Figure 1 to form an electrical cabinet. The removable door is mounted via hooks 62 in holes (not shown) on the side members 20 of the frame 10, thereby forming a quick-release fitting. The end panel 50, has a ventilation hole 52, and cable access recesses 54. Electrical cabinets typically have a width of 19" (approximately 48cm). They are often mounted on wheels (not shown) for ease of movement.

Figure 3 illustrates a view of a portion of an electrical cabinet 70 according to an embodiment of the present invention. This electrical cabinet 70 has no end member. Electrical cabinets that are the same height as the room in which they are located, with cabling coming down from the ceiling, are often used, such electrical cabinets generally have no end members. In this embodiment the side panels 40 have ventilation holes. The side members 20 of the end frame comprise holes 22 which receive hooks attached to elements to be mounted in the electrical cabinet.

Figure 4, illustrates an alternative embodiment of the transverse member 30 of the frame. This member is formed of two main bars or tubular members 36 welded together to form an elongate cross shape. Additional strengthening bars or tubes 38 may be used to support the structure. Although it is preferred to weld or braze the two portions together they may also be attached by crimping, or by screw attachments.

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CLAIMS

1. A frame of an electrical cabinet, said frame comprising:
at least one transverse member connected to at least two side members;
5 said transverse member having a skeletal form consisting of at least one tube and/or bar
with at least one side of said transverse member having a recess in a substantial part of
said at least one side.
2. A frame for an electrical cabinet according to claim 1, wherein
10 said frame comprises two transverse members, said two transverse members being
arranged at opposite ends of said frame and being connected together by said at least two
side members.
3. A frame for an electrical cabinet according to claim 1 or claim 2, wherein said
15 transverse member is formed from two bars or tubes connected together.
4. A frame for an electrical cabinet according to claim 3, wherein said two bars or tubes have
substantially the same shape and are connected together at and around half way along their
respective lengths.
20
5. A frame for an electrical cabinet according to any of the preceding claims,
wherein said two bars or tubes are substantially "U" shaped and are connected together at
the bases of the two "U"s.
6. A frame for an electrical cabinet according to claim 5, wherein the bases of said
25 substantially "U" shaped bars or tubes are substantially straight.
7. A frame for an electrical cabinet according to either of any of claims 4 to 7, wherein
said two tubes or bars are welded or brazed together.
8. A frame for an electrical cabinet according to claim 4, wherein
30 said bars or tubes form a substantially cross shape.

- 9 A frame for an electrical cabinet according to claim 8, wherein
said cross shape is elongate such that the end portions of one side of said elongate cross is
parallel to the other side.
- 5 10. A frame for an electrical cabinet according to any of claims 3 to 9, wherein
said transverse member comprises additional bars or tubes connected as strengthening
members to both of said two tubes or bars.
11. A frame for an electrical cabinet according to any of the preceding claims, said frame
further comprising four side members.
- 10 12. A frame for an electrical cabinet according to claim 11, wherein
said four side members comprise four bars or tubes.
- 15 13. An electrical cabinet comprising a frame according to any of the preceding claims, said
electrical cabinet further comprising removable side panels.
14. An electrical cabinet according to claim 13, further comprising at least one removable end
panel.
- 20 15. An electrical cabinet according to claim 13 or 14, further comprising at least one
removable door.
16. An electrical cabinet according to any one of claims 13, 14 and 15 wherein said
removable side panels and/or said at least one removable door are removably attached to
said side members of said frame by hooks.
- 25 17. An electrical cabinet according to any one of claims 13 to 16, wherein said removable side
panels are mounted on cantilevers extending out from said frame.
- 30 18. A frame of an electrical cabinet substantially as hereinbefore described with reference to
the accompanying drawings.

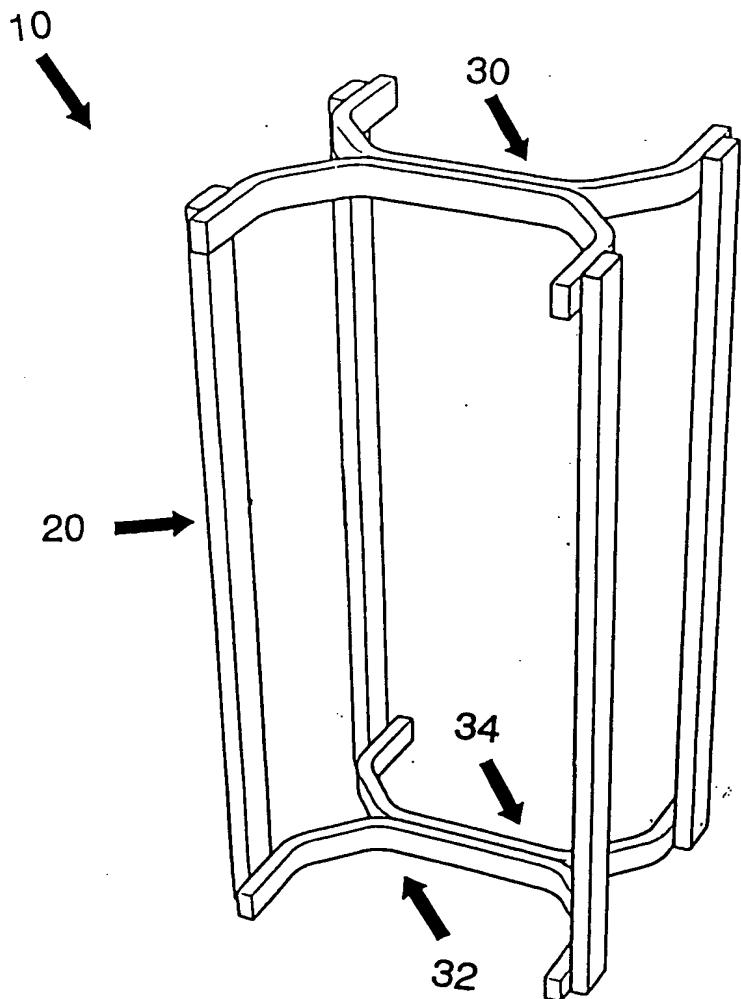
1 An electrical cabinet substantially as hereinbefore described with reference to the accompanying drawings.

ABSTRACTAN ELECTRICAL CABINET AND A FRAME THEREFOR

5 An electrical cabinet 70 and a frame 10 therefor, wherein the frame comprises side members 20 connected together by a transverse member 30. The transverse member 10 is made from bars or tubes in a skeletal form with at least one recess in the side of the transverse member. The skeletal form of the transverse member makes it cheap to manufacture and provides for large recesses, thereby facilitating cable access. The electrical cabinet 70 comprises removable side
10 panels 40 and a door 60 mounted on the frame. The frame also provides mounting points 22 for subracks of electrical or electronic components.

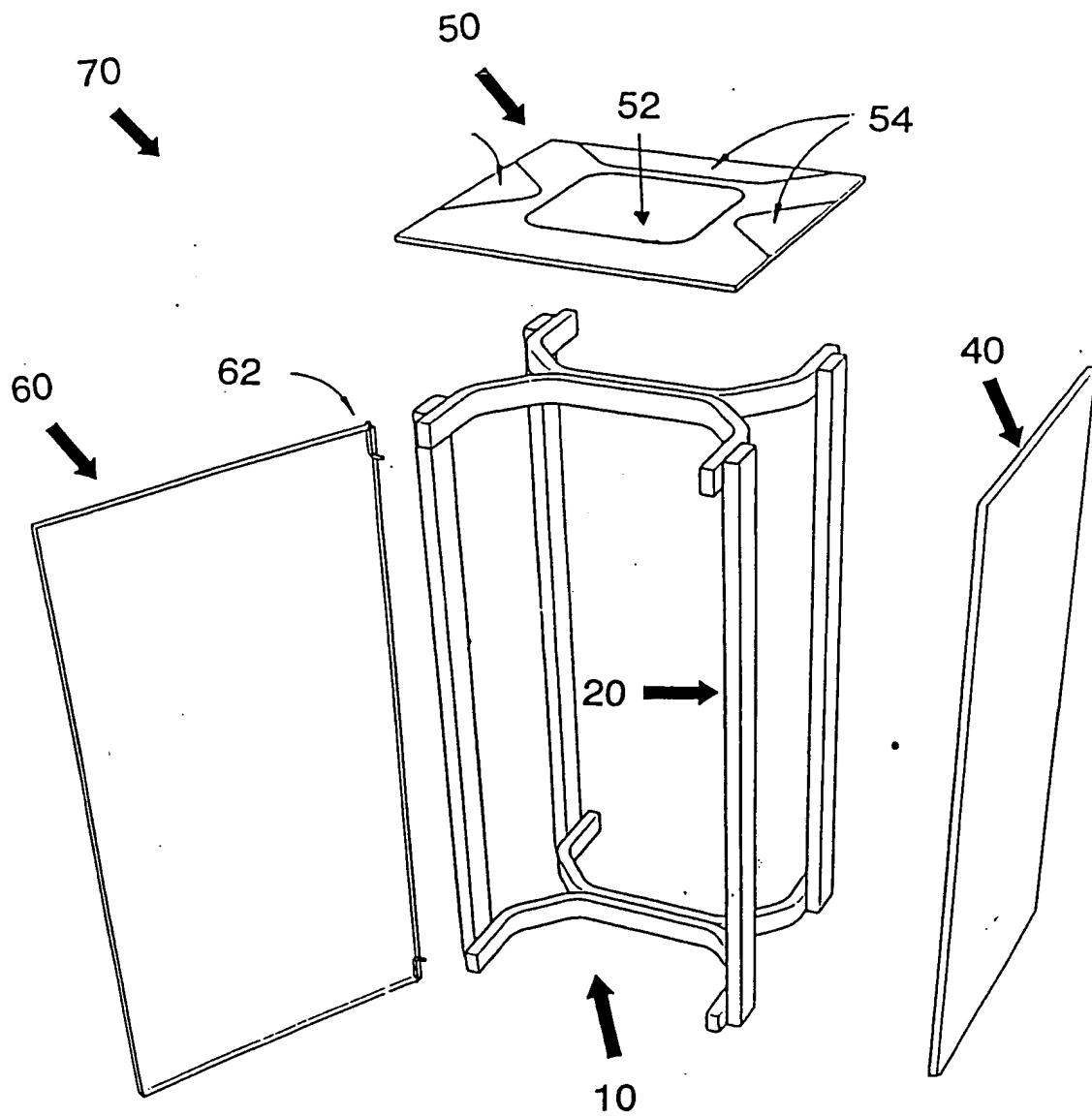
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FIGURE 1



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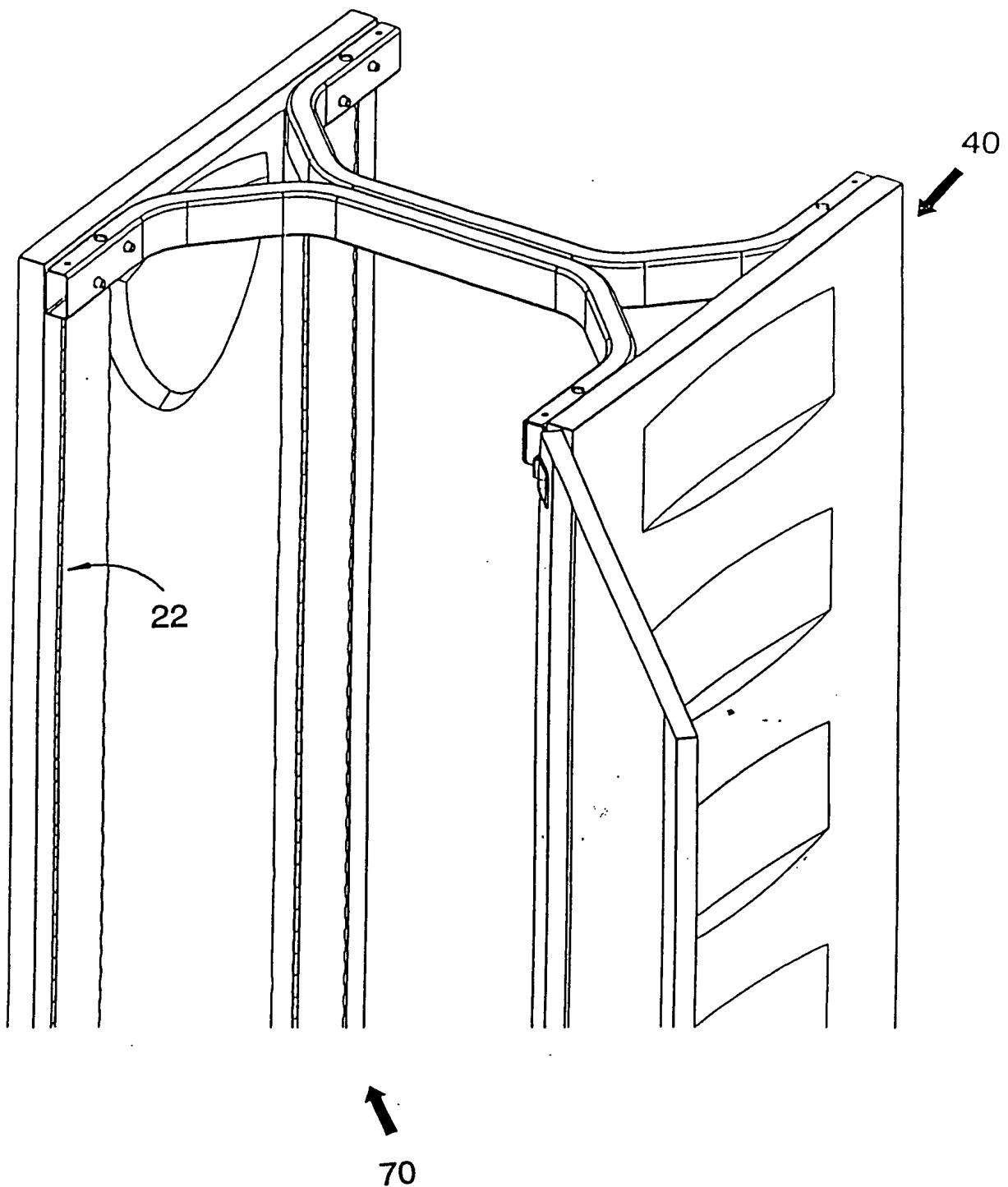
FIGURE 2



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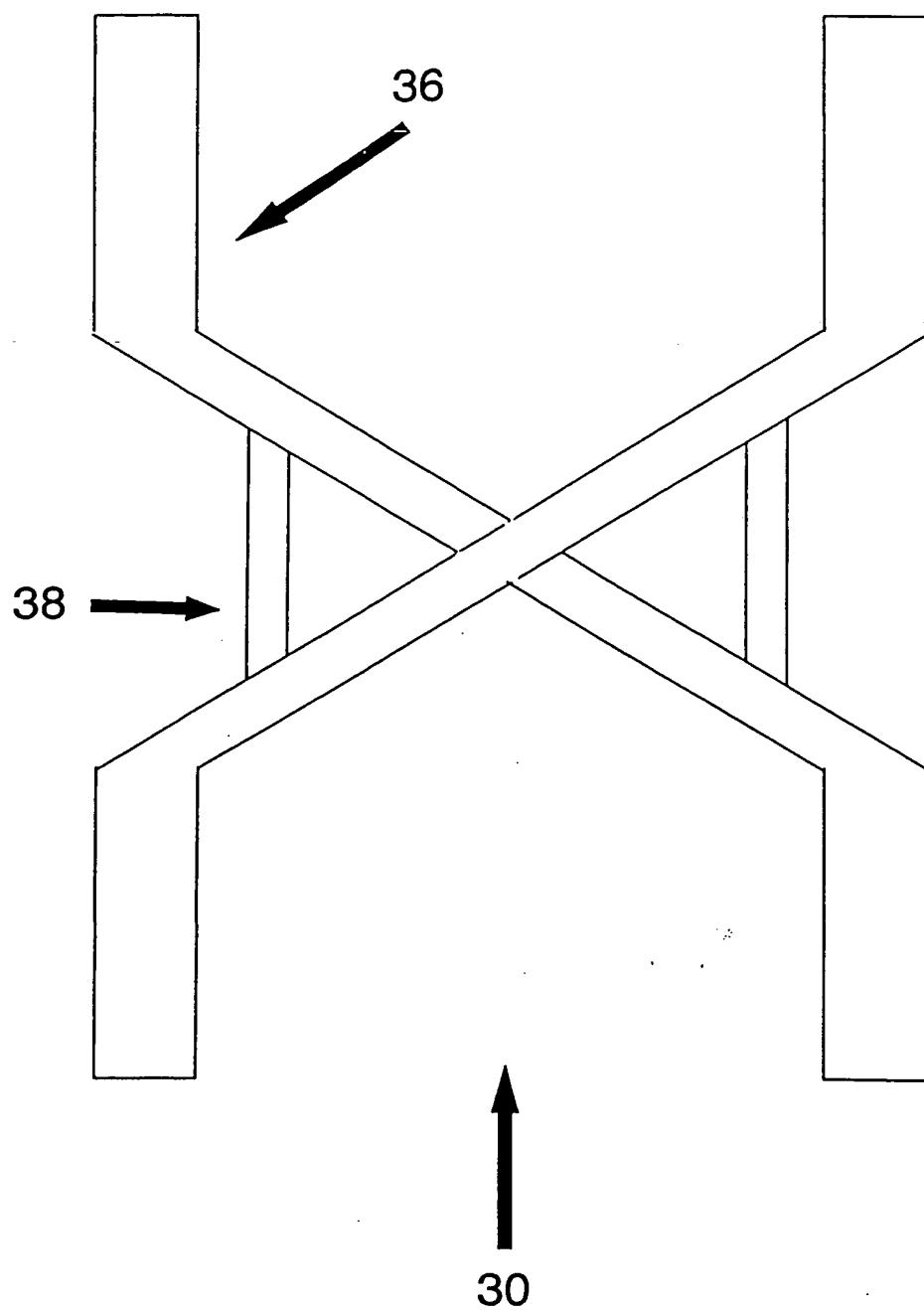
FIGURE 3



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FIGURE 4



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